

## PERIPROSTHETIC BONE REACTION AFTER TJA

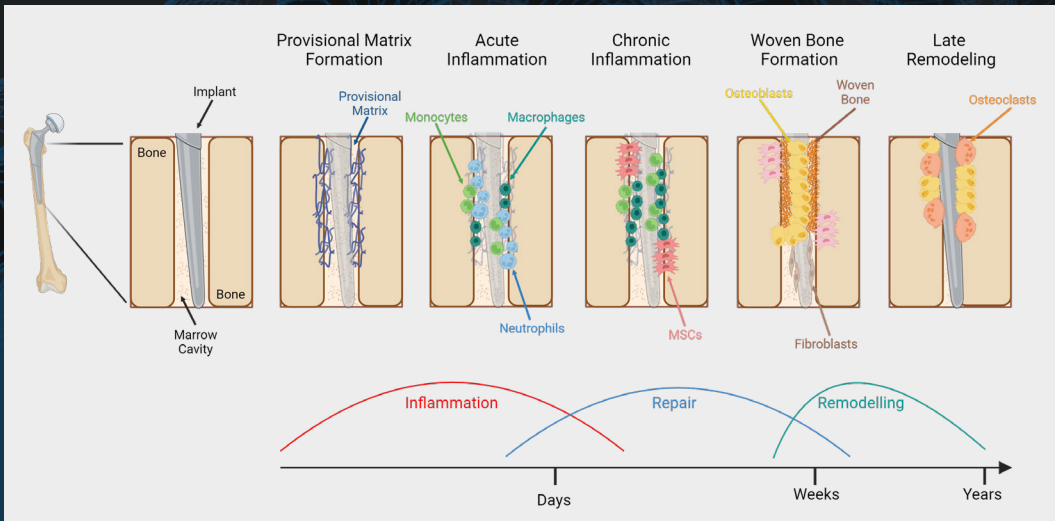


Figure created with BioRender.com, 2024.

# PERIPROSTHETIC BONE REACTION AFTER TOTAL JOINT ARTHROPLASTY

After TJA, periprosthetic bone healing occurs between the implant and the bone surface, properly integrating the implant into bone tissue. The process of periprosthetic bone healing is exemplified with a hip implant in the femoral shaft.

**Provisional matrix formation:** Following TJA, a **provisional matrix** (blue scaffold) is formed in the peri-implant space.

**Acute inflammation:** **Macrophages** (dark green cells) are activated and release inflammatory cytokines into peri-implant space. **Neutrophils** (blue cells) and **monocytes** (light green cells) are attracted and migrate into peri-implant space. Damaged tissue particles are removed.

**Chronic inflammation:** Monocytes infiltrate into peri-implant space and differentiate into macrophages. **Mesenchymal stromal cells (MSCs, pink cells)** are recruited.

**Woven bone formation:** MSCs differentiate into **osteoblasts** (yellow cells), forming immature primary woven bone. **Fibroblasts** (brown cells) adhere on implant surface, forming a fibrous membrane.

**Late remodeling:** Bone remodeling through osteoblasts and **osteoclasts** (orange cells), eventually transforming the woven bone into lamellar bone.

